



# **MPS-1611P**

## **Powered Monitor Operation Manual**



**MILLER & KREISEL**  
P R O F E S S I O N A L

Miller & Kreisel Professional · 9351 Deering Avenue · Chatsworth · CA · 91311 · USA  
tel: (818) 701-7010 · fax: (818) 701-0776 · [www.mkprofessional.com](http://www.mkprofessional.com)

 <p>The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.</p>	<div style="background-color: black; color: white; padding: 5px; margin-bottom: 5px;"><b>CAUTION</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"><b>RISK OF ELECTRIC SHOCK DO NOT OPEN</b></div> <p><b>CAUTION:</b> <b>TO PREVENT THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</b></p>	 <p>The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.</p>
---	--	---

## 1. SAFETY INSTRUCTIONS

1. **READ INSTRUCTIONS** - All safety and operating instructions should be read before this product is operated.
2. **RETAIN INSTRUCTIONS** - The safety and operating instructions should be retained for future reference.
3. **HEED WARNINGS** - All warnings on this product and in the operating instructions should be adhered to.
4. **FOLLOW INSTRUCTIONS** - All operating and use instructions should be followed.
5. **ATTACHMENTS** - Do not use attachments not recommended by the product manufacturer as they may cause hazards.
6. **WATER AND MOISTURE** - Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.
7. **ACCESSORIES** - Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with accessories recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer.
8. **POWER SOURCE** - This product should be operated only from the type of power source indicated on the marking label. If you are unsure of the type of power supply to your home, consult your product dealer or local power company.
9. **OVERLOADING** - Do not overload wall outlets or extension cords as this can result in a risk of fire or electric shock.
10. **LIQUID ENTRY** - Never spill any liquid of any kind on the product.
11. **SERVICING** - Do not attempt to service this product yourself. Opening or removing covers, including any over bottom or side speaker drivers, may expose you to dangerous voltage or other hazards. Refer all service to qualified service personnel.
12. **DAMAGE REQUIRING SERVICE** - Unplug this product from the wall outlet and refer servicing to qualified personnel under the following conditions:
  - When the power-supply cord or plug is damaged.
  - If liquid has been spilled, or objects have fallen into this product.
  - If the product does not operate normally by following the operating instructions. Adjust only controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
  - If the product has been dropped or damaged in any way.
  - When the product exhibits a distinct change in performance - this indicates a need for service.
13. **REPLACEMENT PARTS** - When replacement parts are required be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in risk of fire, electric shock, or other hazard.
14. **SAFETY CHECK** - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
15. **HEAT** - This product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

## TABLE OF CONTENTS

1.	SAFETY INSTRUCTIONS.....	2
2.	INTRODUCTION.....	4
3.	M&K'S DESIGN PHILOSOPHY.....	4
4.	PRODUCT OVERVIEW.....	4
5.	SPEAKER PLACEMENT	
	TWO CHANNEL SPEAKER PLACEMENT.....	5
	MULTICHANNEL SPEAKER PLACEMENT .....	6
	ITU-R BS.775-1 RECOMMENDATION.....	7
6.	INPUTS AND CONTROLS.....	7
7.	MODES & OPERATION.....	9
8.	THE LOGIC BEHIND BASS MANAGEMENT.....	10
9.	CALIBRATING YOUR M&K PROFESSIONAL SYSTEM.....	11
	THE M&K PROFESSIONAL TEST DISC.....	11
10.	SPEAKER CALIBRATION.....	12
11.	SUBWOOFER PLACEMENT.....	12
12.	SUBWOOFER CALIBRATION.....	13
13.	PRODUCT SERVICE.....	13
14.	MPS-1611P SPECIFICATIONS.....	13
15.	SPEAKER MOUNTING OPTIONS.....	14

## DIAGRAMS

FIGURE 1	SPEAKER PLACEMENT/SEPARATION.....	5
FIGURE 2	ITU-R BS.775-1.....	7
FIGURE 3	INPUTS AND CONTROLS.....	8
FIGURE 4	SPEAKER WALL MOUNTING.....	14
FIGURE 5	SPEAKER STAND MOUNTING.....	14
FIGURE 6	SPEAKER STAND MOUNTING.....	14

## 2. INTRODUCTION

Congratulations and thank you for purchasing the MPS-1611P. This Miller & Kreisel Professional powered monitor is designed to provide many years of accurate and problem free operation.

We encourage you to read this owner's manual, as there is a great deal of information provided here to help you get the best possible performance from your new M&K Professional monitor.

If you have any questions regarding any Miller & Kreisel Professional products, please contact your M&K Professional Dealer, or call the M&K Professional factory directly at (818) 701-7010, from 8:30 AM to 5:00 PM Pacific Time. We will be more than happy to help you with any question, no matter how simple or complex it may be. Additional information may also be found on our website [www.mkprofessional.com](http://www.mkprofessional.com) or email us at [support@mkprofessional.com](mailto:support@mkprofessional.com).

## 3. M&K'S DESIGN PHILOSOPHY

Our design philosophy is that accurate and lifelike sound and music reproduction takes place when your ears, in effect, become the recording microphones. Our monitors are designed to allow you to hear precisely what the microphones heard, placing you as close or as far away from the music or sound source as the recording engineer placed the microphones. To achieve this, your M&K monitors are specifically designed and engineered to produce imaging in front of themselves.

Too many so-called "music" loudspeakers are designed with a philosophy that all recordings should sound as if the music comes from a stage 10 or 20 rows distant, even if a recording is closely miked with performers as close as a few inches from a microphone (as is often done on film soundtracks, especially for dialog). This "homogenizing" effect of "music" loudspeakers may be pleasant for some music recordings, but it inaccurately reproduces both close-miked recordings and those recordings that accurately capture the acoustic space of a recording site. This is why many "music" speakers do so poorly when trying to reproduce both the intensity and intimacy of closely miked sound effects and dialog on today's best soundtracks. This is also why most "music" speaker mixes do not "translate" well outside their own mix environment.

As an audiophile recording engineer and a high-end loudspeaker designer, my strong belief has always been that a good loudspeaker should accurately and realistically reproduce whatever the microphone captured, whether the source is a human voice, a musical instrument, an explosion, car crash, etc.; including the depth and acoustic ambiance of the environment in which the source was recorded. This is one key reason why a mix done on an M&K monitor translates so well into any other listening environment from a dubbing stage to a home theater.

Ken Kreisel  
Co-Founder and CEO  
Miller & Kreisel Sound, Inc.

## 4. PRODUCT OVERVIEW

Designed to match the same exacting acoustic standards as the critically acclaimed M&K Professional MPS-2510P, the MPS-1611P features a 100 watt amplifier for the midrange-woofer and a 50 watt amplifier for the tweeter. The speaker's active design provides improved sound quality, wider dynamic range, and a higher output than a passive speaker design due to the elimination of signal losses that occur when high level signals pass through a passive crossover network.

The MPS-1611P's extraordinary accuracy and flatness in both the frequency and phase domains assures critical listeners of precision monitoring for extended lengths of time without listener fatigue. The MPS-1611P is a bi-amplified reference monitor intended for critical listening applications in the near to mid-field listening environment. It is suitable for both stereo and multichannel applications, and can be used either as a stand-alone "full-range" monitor, or in combination with any of M&K Professional's powered subwoofers.

Thanks to M&K's "Unplug & Play" Backfire Bass Port, the MPS-1611P has the flexibility to be used with or without an M&K Professional powered subwoofer. This unique M&K design allows the speaker to be used as either a sealed cabinet suitable for satellite/subwoofer configurations or as a stand alone, "full-range" ported system. Located on the back baffle is a tapered cabinet port that is provided with a removable plug. When the plug is in place, the speaker is a sealed cabinet. To convert the speaker to its ported configuration, the user simply removes the plug, hence "Unplug & Play!"

The MPS-1611P's Backfire Bass Port is positioned on the back baffle of the speaker cabinet which extends and improves the port performance.

This two-way monitor uses a new M&K high-output ferrofluid cooled 1" Fabric Dome Transmission Line tweeter. The Transmission Line is a proprietary, self-contained absorptive tube which both loads and absorbs the tweeter dome's backwave

into its correct acoustic impedance and prevents the backwave from reflecting off the tweeter's back surface plate, significantly reducing high frequency smearing and phase/combing anomalies.

The MPS-1611P's 6.5" polypropylene woofer uses a new ultra-low distortion motor structure with a number of proprietary features. Its magnet shielding can provides for full magnetic cancellation/shielding, allowing the speaker to be used near CRT monitors or other magnetic field sensitive devices without the worry of picture aberration or distortions.

Similarly, the self contained power supply uses a special toroidal transformer to constrain the external magnetic power supply field to non-interfering levels. Designed for world-wide use, the MPS-1611P is available in 100V, 115V, and 220/240V versions, all operating at 50/60 Hz.

The robust MDF cabinet uses internal bracing to optimize sonic integrity, and all corners of the front baffle are radiused to minimize high frequency cabinet diffraction. Its special satin epoxy finish will stand up to years of heavy use.

## 5. SPEAKER PLACEMENT

### TWO CHANNEL SPEAKER PLACEMENT

The sound quality produced by your speakers can be significantly enhanced by careful attention to their placement. There are several things that you can do to achieve an excellent monitoring environment in your room.

These four factors are essential to achieving excellent performance from your speakers:

- A. Height or angle
- B. Location away from walls or reflecting surfaces
- C. Separation between Left and Right speakers
- D. Vertical orientation of the speaker cabinets

#### A. Height or angle

Your M&K speakers are designed for very fast and accurate transient response. They will provide you with the best sound quality and flattest frequency response when properly oriented relative to your ear. Ideally, the tweeters should be on the same axis as your ears when you are sitting in your main listening position. If your speakers are mounted above or below this position angle the speakers so that the tweeters are aimed at your ears when you are in the main listening position.

A green LED has been installed inside the front baffle of the MPS-1611P above the tweeter. This LED can be used as an alignment tool for you speakers and indicates perfect on-axis alignment when the LED is at its brightest.

#### B. Location away from reflecting surfaces

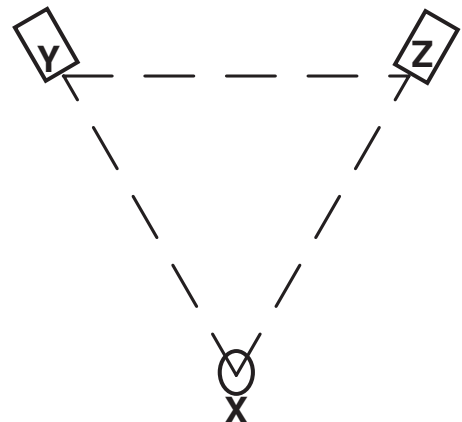
Whenever possible, do not place your speakers directly on the mixing console. Contact with the console can create a build-up of certain frequencies, particularly in the low to low-mid frequencies, that will cause uneven bandwidth reproduction. Additionally, speakers placed on the console disperse sound onto the console as well as the listener. The reflected sound off the console arrives at the ear slightly later than the direct sound. This results in comb-filtering, phasing and a general blurring of the sonic image.

To avoid these problems, M&K makes a full line of stands and mounting brackets that will help you properly install your speakers to optimize their performance. Check with your M&K dealer or log onto our website at [www.mkprofessional.com](http://www.mkprofessional.com) for more information.

Remember to allow for adequate ventilation for your speakers. The MPS1611P power amplifiers are mounted on the back of the cabinet and these generate heat through the heatsink. Leave at least three inches of clearance around the back of the speaker and do not place them close to heaters or heating ducts.

#### C. Separation between left and right speakers (Figure 1)

The MPS-1611P is designed as a near to mid-field monitor. This generally means placing the speakers at a distance of 3 to 6 feet (roughly 1 to 2 meters) from the listener. Many engineers feel that creating an equilateral



**FIGURE 1** **SPEAKER SEPARATION**  
**XY = YZ = ZX**

triangle between the two speakers (Y & Z) and your listening position (X) provides the best placement solution. This means that the distance between you and each speaker and the distance between the two speakers should be equal. Or, if the distance between you and one of the speakers is 6 feet, make the distance between the two speakers 6 feet and the distance between you and the other speaker 6 feet as well. See Figure 1.

Angle the speakers towards you until you can see the green LED at its brightest. This will insure that the woofer and tweeter are pointed directly at your ears.

If you set up your system and you feel that you don't have phantom center clarity, your speakers may be too far away - try moving the speakers closer together until they center channel image is restored.

#### D. Vertical orientation

The MPS-1611P is designed to be oriented vertically. This orientation provides the best image and phase-coherency. for this reason, the bracket mounting holes are located on the bottom of the cabinet.

Horizontal orientation can be used, if your installation requires this.

## MULTICHANNEL SPEAKER PLACEMENT

There is considerable debate within the professional audio community as to the best speaker placement for multichannel mixing. Some mixers use placement solutions that are understood and well accepted, while others remain unconvinced about a speaker placement standard and prefer to try other options.

One of the biggest obstacles to accurate monitoring in the control room is the recording console. With its large, flat surface and its placement in the middle of the room, it provides the largest reflective surface between you and your speakers. Reflected sound coming off the console arrives later than direct sound. The combination of direct and reflected sound creates distortion in the form of comb-filtering. For this reason, we recommend that you do not place your speakers on the console itself, but rather on stands around the console or wall-mounted on brackets above the console. M&K manufactures a full line of stands and brackets which are designed to solve practically any installation problem. Check with your M&K dealer or log onto the M&K Professional website, [www.mkprofessional.com](http://www.mkprofessional.com) for details.

In a multi-channel listening environment, all speakers should be of the same model and placed equidistant from the listener. This is to maintain coincidental arrival of all channels at the listening position. If the center channel must be a smaller speaker, we recommend using the MPS-1520 center channel speaker. Its timbre is matched to that of our other main monitors.

When the MPS-1611P is used as a front loudspeaker it should be located with the tweeter at seated ear height. If this is not possible the MPS-1611P must be angled in the vertical plane and toed-in to meet at seated ear height at the center of the primary seating/monitoring location so as to cover the listening area uniformly with high frequency energy. A green LED has been mounted on the center axis of the speaker. This LED can be used as an alignment tool for final aiming of the loudspeakers and indicates perfect on axis alignment when the LED is at its brightest.

If the speakers are not at seated ear height, it is recommend that they not be higher than 15 degrees above that plane.

All five speakers in a surround sound system should be of the same model or with Tripole surrounds for the rear speakers. Sometimes, however, the surround speakers must be smaller than the mains. M&K Professional offers several smaller models that are timbre matched to our larger speakers.

If the speakers are located behind an acoustically transparent picture screen it is recommended by SMPTE and THX that they be placed at 5/8 the height of the picture screen. Placing the speakers in this manner will ensure that sound elements relate best to the image.

When placing loudspeakers around a video monitor, it is best to place all three main speakers either all above or all below the screen. Placing the center channel speaker on a different horizontal plane from the left and right speakers will create different arrival times and will adversely effect imaging.

**NOTE: All M&K Professional main monitors are shielded. However, be careful not to place M&K Tripole surround monitors near video monitors as the side-firing drivers may gauss the video monitor and distort the visual image.**

For the best low frequency match between speakers, we recommend the speakers be placed a minimum of 3 feet (or 1 meter) in front of any wall. If the MPS-1611P is placed inside a cabinet, resonances from the cabinet cavities should be eliminated; a combination of front baffling, internal dampening, and perforation of the sides and rear of the cabinetry should

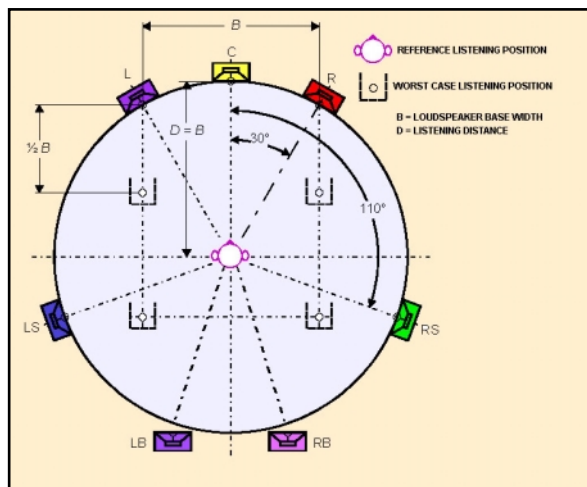
reduce the resonance effects.

The base monitoring width (also referred to as monitoring angle) is important for both music and film sound reproduction. Monitoring angles from 45 to 60 degrees are commonly used for proper translation and accurate stereo imaging. While the stereo base width will become greater in larger rooms or with greater monitoring distances, in rooms where picture is used as reference the size of the picture will dictate the available width. In general, a stereo base width corresponding to angles of 45 degrees, relative to the left and right loudspeakers, when viewed from the principal seating location, is preferable for mixing sound with picture. Wider monitoring angles up to 60 degrees (are more common for music mixing). Placement optimization should also include locating the speakers in such a way as to put all speakers equidistant from the listening position. This time-aligns the speakers to the monitoring position and improves imaging. A digital delay may be used to achieve similar results.

## ITU-R BS.775-1 Recommendation

Many professionals find the ITU-R BS.775-1 recommendation useful as either a final placement solution or as a starting point from which to work. This recommendation is based on placing the speakers at equal distances around a 2.5 meter circle with the height of each speaker at 1.2 meters. The center speaker is placed directly in front of the listener with the left and right speakers placed 30 degrees on either side of the center speaker. Placement of the surrounds is somewhat more flexible. The ITU recommends that the surrounds be placed anywhere between 100 and 120 degrees from the location of the center speaker with 110 degrees being the most common solution. Placing the surrounds farther behind the mixer (120 to 135 degrees) may cause the single enveloping sound field to collapse leaving the listener with two distinct and seemingly unrelated soundfields.

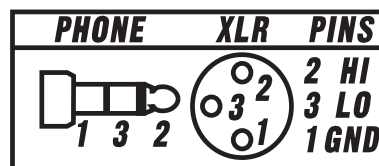
The ITU-R BS.775-1 placement solution works very well in critical listening environments where the listening position is known and is especially effective for those working in applications like music composition and mixing, sound design, broadcast and DVD authoring.



**FIGURE 2 ITU-R BS.775-1 SPEAKER PLACEMENT RECOMMENDATION**

## 6. INPUTS & CONTROLS (SEE FIGURE 3)

- A) XLR - 1/4" (Phone) Balanced Input
  - Pin 1 Sleeve (ground)
  - Pin 2 Tip (plus)
  - Pin 3 Ring (minus).
- B) Unbalanced RCA Input
- C) Power Indicator LED
- D) Input Sensitivity Selector – use the FIXED position when a 200mV referenced signal is delivered to the XLR input or when a 100mV referenced signal is delivered to the RCA input. In order to use the variable gain knob (E), the input gain switch must be set to the VARIABLE position.



NOTE: Pink Noise input signal to give a set output SPL:

"Fixed" = 200mV Balanced (100mV unbalanced) gives 91 dB at 1m

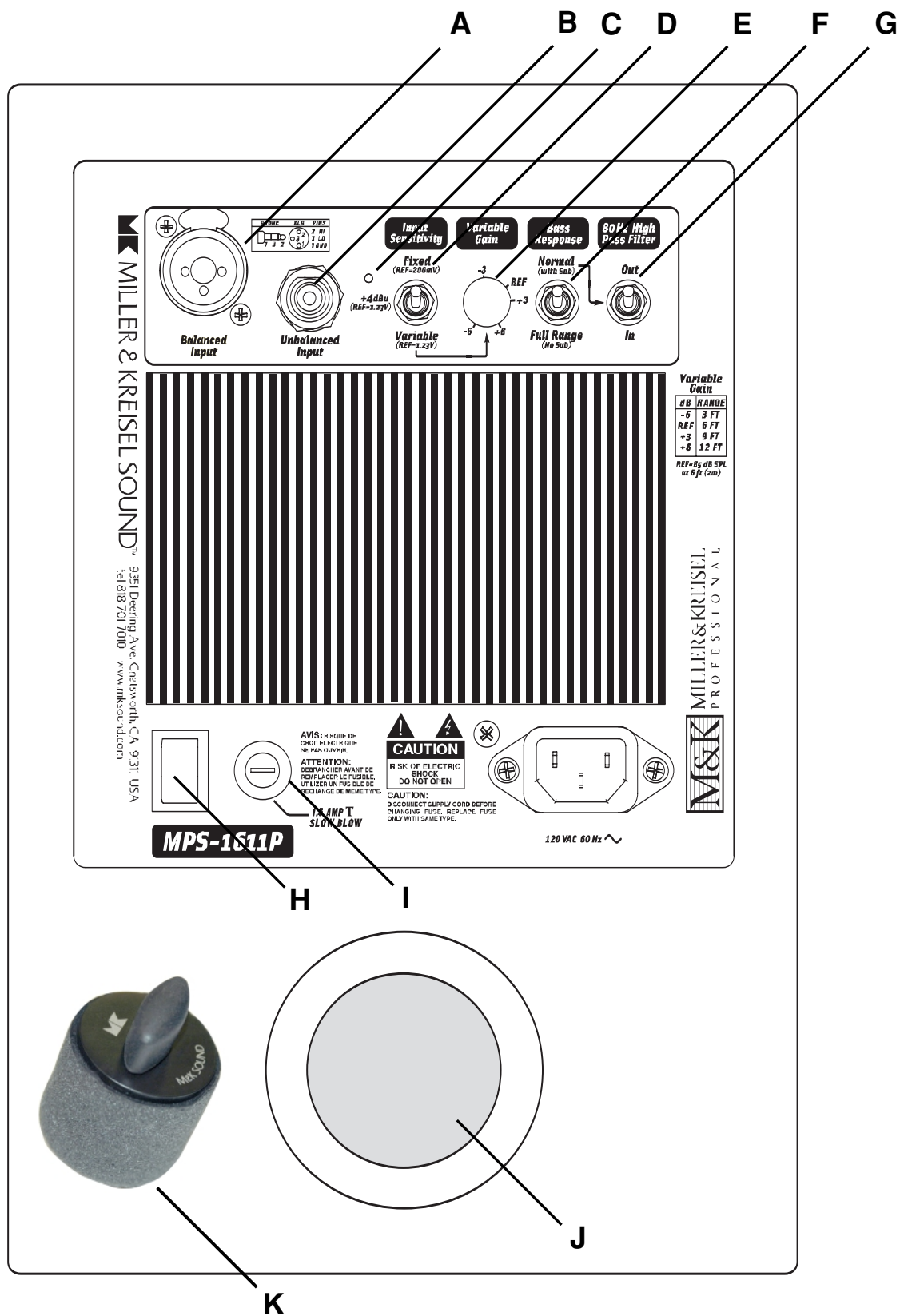
"+4dBu" = 1.23V Balanced (615mV unbalanced) gives 91 dB at 1m

- E) Variable Input Gain Controller – offers variable gain from –6dB to +6dB relative to the REFERENCE position. REFERENCE denotes the position that should be used when operating this monitor with +4dBu referenced input signals. In other words, in variable gain mode the "REF" position on the control gives the same level as the "+4dBu" switch position.

**(Note: This control is only effective when the input gain switch (D) is set to the VARIABLE position.)**



**FIGURE 3 MPS-1611P INPUTS AND CONTROLS**





- (FIGURE 3)** F) Bass Response Switch – Normal (up) or Full Range (down)
- G) 80Hz High Pass Filter Switch – In (down) or Out (up). When the switch is in the IN position, a 12dB per octave 80Hz High-Pass Filter is placed on the input stage of the monitor. The OUT position bypasses this internal filter. This switch should be in the OUT position when used with any external bass-management controller, such as an M&K LFE-4, LFE-5, BMC-Mini or any other component such as a consumer processor that has built-in 80Hz High-Pass filters.  
**(Note: Engaging Full Range mode automatically bypasses the 80Hz high pass filter.)**
- H) Power Switch
- I) Fuse Holder  
- for 110 – 120 VAC, use a 1.5A Slow-Blow fuse use 1.5A Slow Blow fuse.  
- for 220 – 240 VAC, use a 750mA Time Lag fuse.  
- for 100VAC, use a 1.8A Time Lag fuse
- J) Backfire Bass Port
- K) Port Plug

## 7. MODES OF OPERATION

MODE	USAGE	PORT PLUG	BASS RESPONSE SWITCH	80Hz HIGH-PASS FILTER SWITCH
<b>NO SUBWOOFER</b>				
FULL RANGE PORTED(E)	HIGH SPL CAPACITY 45Hz- 22kHz	OUT	NORMAL	OUT
FULL RANGE PORTED(A)	HIGH SPL EXTENDED BASS RESPONSE 35Hz - 22kHz	OUT	FULL RANGE	BYPASSED IN THIS MODE
FULL RANGE SEALED (D)	EXTENDED BASS RESPONSE 35Hz - 22kHz	IN	FULL RANGE	BYPASSED IN THIS MODE
<b>WITH SUBWOOFER</b>				
INTERNAL FILTER IN (C)	USE WITH SUBWOOFER WITHOUT EXTERNAL BASS MANAGEMENT CONTROLLER	IN	NORMAL	IN
INTERNAL FILTER OUT(B)	WITH SUBWOOFER USING BASS MANAGEMENT	IN	NORMAL	OUT
HIGH BASS SPL USAGE (F)	WITH SUBWOOFER USING BASS MANAGEMENT	OUT	NORMAL	OUT
	WITH SUBWOOFER - NO BASS MANAGEMENT	OUT	NORMAL	IN

The MPS-1611P is designed to be used either as a “full range” speaker without the use of a subwoofer, or as a main or surround speaker in a 2.1, 5.1, 6.1, or 7.1 channel satellite/subwoofer system.

There are six possible operating options with the MPS-1611P. They have been provided so that you may custom tailor the performance of the MPS-1611P to suit your personal requirements. This flexibility is provided by the various applications of the port plug, bass response switch (F in Figure 2) and high pass filter switch (G in Figure 2).

**For sealed cabinet alignments leave the port plug in the cabinet.  
For ported cabinet alignments remove the port plug.**

We encourage experimentation with all these alignments and suggest the following as excellent starting points.

When using the MPS-1611P as a main or surround speaker in a stereo or multichannel system with a subwoofer, we recommend option B.

When using the MPS-1611P as a “full-range” speaker without a subwoofer, we recommend option D.

**SEALED CABINET ALIGNMENTS: Install “Unplug-&-Play” port plug**

(see figure 3)

A. "Full Range" Mode – (F) Switch position is down. (G) Switch is disabled in this mode. For extended bass response in a sealed alignment without the use of a subwoofer. 60Hz - 22kHz  $\pm$ 3dB. -6dB @ 50Hz.

B. "Normal" Mode – (F & G) Switch position is up for both. For subwoofer use with an external bass management controller (LFE-4, LFE-5, BMC-Mini 80Hz). This is the standard M&K Satellite Low Frequency alignment. 80Hz - 22kHz  $\pm$ 3dB. -6dB @ 60Hz.

C. "Internal Filter In" Mode – (F) Switch position is up. (G) Switch Position is down. For subwoofer use without an external Bass Management controller. 90Hz - 22kHz  $\pm$ 3dB. -6dB @ 80Hz.

***PORTED CABINET ALIGNMENTS: Remove "Unplug & Play" port plug***

D. "Full Range" Mode – (F) Switch position is down. (G) Switch is disabled in this mode. For extended bass response in a ported alignment without the use of a subwoofer. 55Hz - 22kHz  $\pm$ 3dB. -6dB @ 50Hz.

E. "Normal" Mode – (F & G) Switch position is up for both. 65Hz - 22kHz  $\pm$ 3dB. -6dB @ 60Hz.

F. "Internal Filter In" Mode – (F) Switch position is up. (G) Switch Position is down. 80Hz - 22kHz  $\pm$ 3dB. -6dB @ 70Hz.

## **8. THE LOGIC BEHIND BASS MANAGEMENT**

***OBSERVATIONS by Ken Kreisel***

Engineers mixing multi-channel audio (Stereo, Dolby Surround, 5.1 Dolby Digital, DTS, and other surround-sound formats) are faced with numerous challenges when trying to accurately monitor complex and dynamic material, and determine how this material will sound in its intended playback space. These issues include reproducing 5, 7, or more channels of full range audio, plus an optional Low Frequency Effects channel (LFE), all of which have a bandwidth to 10Hz or below, with very high dynamic range, and achieving consistent bass response from all the channels throughout the control room monitoring area.

Any studio designer will tell you that for a stereo mix environment it is crucial that the left and right monitor speakers, when in their selected studio location, have near identical bass response when measured at the mixer's position. No less is true in multichannel mixing. Proper low frequency equalization and mixing decisions are difficult, if not impossible, unless all 5.1 or more channels have the same bass frequency response at the mixers listening position.

Due to unavoidable room modes, five or more correctly placed full range speakers, (in even the most perfectly designed studio) will produce dramatically different low frequency characteristics at the mix position. This is especially true for the very crucial center channel speaker. Variations of 10 to 20dB may be measured at frequencies below 80Hz.

When the bass from all the channels is redirected into a single, PROPERLY placed subwoofer, then each and all of the multiple channels exhibits the identical bass response at the listening position, and gives surprisingly even coverage in virtually every control room. Simply stated bass management is putting an electronic bass frequency crossover (typically 80Hz) on all the channels, and redirecting the bass frequencies below 80Hz from each of the channels to a common subwoofer.

By combining a carefully designed low frequency acoustic rolloff of all the main speakers, including the surrounds, and a matching 2nd order electronic filter in the M&K Bass Management Controller, M&K achieves all the theoretical benefits of a 4th order Linkwitz-Riley filter.

Another good reason for using bass management in the control room is that even the least expensive Dolby Digital consumer decoder, found in millions of homes, has bass management built in, allowing the bass from all channels to be fed to a single subwoofer. Also, all Home THX systems utilize an 80Hz bass management system. Monitoring with proper bass management in the professional control room insures proper playback translation into the "home theater" environment and into larger spaces such as motion picture theaters.

It is important to understand that Bass Management is done as a function of the monitoring system and in no way affects the actual mix. Full frequency musical content, is assigned or panned around the room via normal console or software operations to the various desired subjective locations such as Left, Center, Right, Left Surround, and so on. This full frequency musical data corresponding to each speaker location channel is stored normally on tape, hard drive, etc.

Bass Management psychoacoustically works because the ear-brain mechanism cannot detect direction at low frequencies, but takes its directional cues from the harmonics of the low frequency sound. In the monitoring process, frequencies below 80Hz are redirected to the subwoofer. Frequencies above 80Hz are sent to the desired speaker. During the hearing process, our hearing mechanism integrates the sound into the correct spatial auditory image.

Bass management is equally suited to all formats from 2-channel stereo to 5.1 and beyond. Indeed, existing control rooms that are doing stereo 2 channel mixes, especially with smaller nearfield monitors placed on the console, can benefit immensely from the correct integration of Bass Management and a subwoofer; because the engineer is now able to hear low frequency anomalies caused by room rumble, microphone stand thumping, breath pops, and other artifacts that cause undesirable actions later in the broadcast, film chain, or DVD Mastering process.

When mixes are intended for theatrical presentation, it is sometimes necessary to use an additional channel for extra low frequency effects or enhancement. This channel is called the LFE or Low Frequency Effects/Enhancements channel. In the control room monitoring environment, the LFE channel, if or when it is used in the mix, is monitored by the same subwoofer used for the regular [L,C,R,LS,RS] channels. M&K Bass Management Controllers have both a 0dB (with unity gain) and +10dB (with 10dB gain) inputs to accommodate any mixing / monitoring situation, as per Dolby specifications.

The M&K Professional Division supplies, at no additional charge, a special CD test disc to assist in the proper setup and calibration of our Bass Management Systems. This disk has pre-filtered and calibrated tracks of noise which allow quick, accurate, and error-free setup of the monitoring environment to the Dolby standard of 85dB SPL, or any other relative reference level, by using an SPL meter.

## 9. CALIBRATING YOUR M&K PROFESSIONAL SYSTEM

A. For this set-up procedure, you will need the following:

- 1.) An SPL meter. Radio Shack has an analog SPL meter that is very effective and not expensive.
- 2.) The M&K Professional test CD (supplied with the M&K LFE4 or LFE-5 or available as a download from [www.mkprofessional.com](http://www.mkprofessional.com)).
- 3.) A small, flat bladed screwdriver (or "tweezer") to adjust the channel trim pots on the LFE-4 or LFE-5.
- 4.) A CD player, or DVD player that can play CD-R's (unless you have downloaded your tones).
- 5.) An M&K speaker system with the LFE-4 or LFE-5 Bass Management Controller.

B. It may be helpful to have one person sit at the listening position and read the meter while another person adjusts the trim pots on the LFE-4 or LFE-5.

C. When the slot of the channel trim pots on the LFE-4 or LFE-5 are pointing straight up and down, the gain of each of the channels is approximately 0dB or unity. The trim pots have a plus or minus 12dB gain range. Rotating the pot counter-clockwise will attenuate the channel a maximum of -12dB and rotating the pot clockwise will boost the channel gain a maximum of +12dB. The maximum output of the LFE-4 or LFE-5 is + 27dBu. With a nominal signal level of + 4dB with 20dB of headroom, the maximum signal level from the source (console, etc.) can be + 24dB. Therefore, at very high signal levels you can only add around + 3dB of gain with the trim pots before the signal chain of the LFE-4 or LFE-5 overloads. If you need more than 3dB of gain at high signal levels, it is better to increase the output of power amplifiers and use the trim pots on the LFE-4 or LFE-5 for fine tuning.

### The M&K Professional test disc

A specially designed and produced test disc has been included with your LFE-4 or LFE-5.

Ken Kreisel has designed this test disc expressly for use with M&K satellite/subwoofer loudspeaker systems. The tones on this disc are all bandwidth-limited Pink noise. This is to avoid room anomalies and therefore provide a more accurate calibration. By using this disc with a Radio Shack SPL meter and following the instructions in this manual, you can achieve a remarkably accurate system calibration.

The goal here is not to find an absolute SPL level, but to balance the SPL level of all channels relative to each other. For this application, the Radio Shack SPL meter will work very well.

If a more accurate calibration is desired, we recommend using a real time analyzer with calibrated microphones and appropriate room analyzing software.

### ***Following are the tones found on the M&K test disc:***

Track one: Band limited Pink Noise from 500Hz to 3kHz recorded at -20dB FSD. Use this tone to calibrate your main and surround (satellite) speakers.

Track two: Band limited Pink noise from 40Hz to 80Hz recorded at -20dB FSD. Use this tone to adjust your subwoofer level.

Track three: 1 kHz sine wave recorded at -20dB FSD. Use this to set the reference level of your source (console, etc.) On an analog console this will be 0VU. On digital sources this will be either -20dB FSD or -18dB FSD.

## 10. SPEAKER CALIBRATION

1. Your speakers should now be in their final positions.
2. Remove all EQ and signal processing from the monitor path.
3. Turn all volume controls in the signal chain to their "reference level" position. These volume controls include the console main monitor pot, submaster faders and power amplifier volume pots. The "reference level" position is your defined reference playback level, which is typically 85dB SPL for film, video and music. For the purposes of this discussion, we will assume that 85dB SPL is your reference level. If you use a different reference level, then substitute the level that you use whenever you see 85dB SPL.
4. Transfer one channel only (left or right) of the M&K Professional test CD onto your audio storage medium (Pro Tools, open reel recorder, etc.). It is important that the tones be played back from your source through the normal routing of your console or Pro Tools system so that the system calibration is conducted through the same signal path that your audio goes through.
5. Select track three on the test CD and use the 1kHz tone to level-set your console for 0VU on an analog console, or -18 FSD if working digitally. Do not move the faders once you have level-set your monitor path.
6. Select track one on the test CD and route it to the speaker that you want to calibrate (for example: left front).
7. Set your SPL meter for C weighting (flat) and slow (average) response. Set the scale to 80dB. Hold the meter at about a 45 degree angle to vertical and at arm's length to avoid a false reading from sound bouncing off your body and into the microphone. Point the meter at the center speaker at about ear height. Play track one of the test CD through the selected speaker and read the SPL. Adjust the level to 85dB using a small screw driver on the trim pot on the selected channel of the LFE-4.
8. Do the same for all front (or main) speakers and point the meter at each speaker in turn. The meter's microphone is directional.
9. Do the same for the surround speakers (Note: the film community prefers to use 82dB as the reference level for surround speakers while DVD authors, broadcasters and music mixers prefer to set all their speakers, including the surrounds, to the 85dB standard.)

(NOTE: if your speakers are moved, it is recommended that the whole system be re-calibrated.)

## 11. SUBWOOFER PLACEMENT

Perhaps the most challenging aspect of tuning a subwoofer/satellite monitor system is finding the best place to put the subwoofer in the listening room. Each room exhibits unique characteristics and challenges because of the wide range of size, shape, building materials and equipment in the room.

Generally speaking, it is not a good idea to place the subwoofer directly in the center between the left and right speakers. There's usually a null in this location which absorbs low frequencies rather than reinforcing them. Instead, try placing the subwoofer near a wall or even in a corner of the control room. When properly set up, the low end will still sound tight and phase-coherent with the satellites even though the subwoofer is placed off-center. This is because the wavelengths of low frequencies are very long and are omni-directional.

Remember that when you place the subwoofer near a wall the sound will couple with the wall and create an extra 3dB of gain. Place the subwoofer in a corner and you will pick up additional 3dB of gain.

An effective way to find the best location for the subwoofer is to start out by placing the subwoofer at the listening position. Connect an audio source to the input of the subwoofer and play music with good low-end content through the subwoofer. While the music is playing, move around the room in areas that you think might be good locations for the subwoofer's final placement. Try to locate an area that responds well to the music being played by the subwoofer. Listen for even, well-defined, low frequency response. Once you have settled on a possible placement, move the subwoofer to that location. Experiment with aiming the subwoofer directly at the console, or aiming it at a wall or even aiming it along a wall. Once you have found a good placement solution for the subwoofer, play program material that you are familiar with through the satellites and subwoofer and check the sound quality. Two-channel material is good for this as the imagery of the phantom center depends upon equal volume from both channels and phase coherency of the satellites with the subwoofer.

Using the guidelines in this manual and with a little experimentation, it will be possible to find a solution for almost any room.

## 12. SUBWOOFER CALIBRATION

A. Set your SPL meter for C weighting and slow response. Set the scale to 80dB. Point the meter at the center speaker at ear height with the meter at a slightly up-turned angle. Play track two of the test CD through the selected speaker and read the SPL (Remember that the LFE-4 will re-route all frequencies below 80 Hz to the subwoofer.) Adjust the subwoofer level using a small screw driver to 85dB on the subwoofer trim pot on the LFE-4 or LFE-5.

B. Next, route track two on the TEST CD to each of the 5 channels. Make sure that the subwoofer level is exactly 85dB SPL for all channels. If they are not, you may have a frequency response problem in the signal path that will have to be corrected before proper calibration can be achieved.

## 13. IF YOU NEED SERVICE OR SET-UP ASSISTANCE

Contact your dealer or M&K with a complete description of the problem. Please have the unit's model and serial numbers (found on the back of the cabinet), date of purchase, and your dealer's name. You can call M&K between 8:30 AM and 5:00 PM Pacific Time, Monday through Friday, at (818) 701-7010. If you call outside these hours, leave a message, and we will return your call promptly. Alternatively, an email can be sent to [service@mkssound.com](mailto:service@mkssound.com).

## DO NOT RETURN YOUR SPEAKERS TO THE FACTORY FOR SERVICE WITHOUT OBTAINING PRIOR AUTHORIZATION

## 14. MPS-1611P SPECIFICATIONS

### DRIVER COMPLEMENT:

1 X 1" SOFT-CLOTH-DOME FERROFLUID COOLED TWEETER  
1 X 6.5" ULTRA-LINEAR MOTOR POLYPROPYLENE WOOFER

### FREQUENCY RESPONSE: (anechoic) (wall or console loaded) (wall or console loaded) (wall or console loaded)

80 Hz – 22 kHz +/- 3 dB (sealed cabinet – Normal setting)  
35 Hz – 22 kHz +/- 3 dB (sealed cabinet – Full Range setting)  
45 Hz – 22 kHz +/- 3 dB (ported cabinet – Normal setting)  
35 Hz – 22 kHz +/- 3 dB (ported cabinet – Full Range setting)

### INTERNAL CROSSOVER FREQUENCY:

1.6 kHz

### CABINET TYPE:

PORTED OR SEALED ENCLOSURE (WITH PORT PLUG)

### POWER AMPLIFIER TYPE:

2 CHANNELS BI-AMPED/MIXED BI-POLAR DMOS TECHNOLOGY

### CONTINUOUS RMS POWER OUTPUT:

#### MIDRANGE/WOOFER AMP:

100 WATTS INTO 8 OHMS @ 0.02% THD @ 100 Hz

#### TWEETER AMP:

50 WATTS INTO 4 OHMS @ 0.02% THD @ 3 KHz

### FIXED & VARIABLE INPUT SENSITIVITY:

REF = 200mV Balanced/Unbalanced:

200mV/100 mV = 85 dB SPL @ 6 feet/2 Meters

REF = +4dBu Balance/Unbalanced:

1.23V/.615V = 85 dB SPL @ 6 feet/2 Meters

VARIABLE (REF = +4dBu ±6dB):

85 dB SPL @ 3 feet (-6dB) to 12 feet (+6dB)

### S/N RATIO:

>90 db

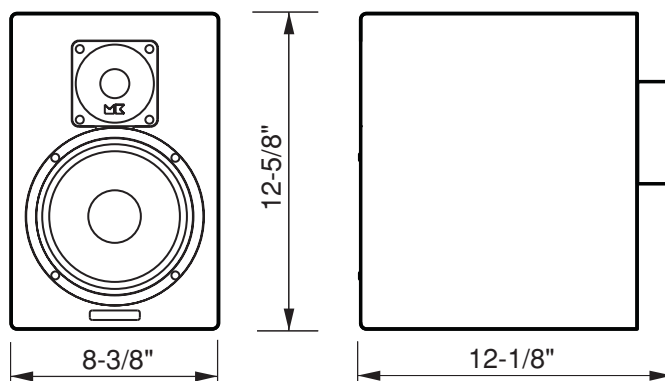
### DIMENSIONS:

12 5/8" x 8 3/8" x 12 1/8" (HWD)  
32 cm x 21.3 cm x 30.7 cm (HWD)

### WEIGHT:

21 lbs. (9.4 kg)

(Specifications subject to change without notice)



## 15. SPEAKER MOUNTING OPTIONS

The MPS-1611P, like all Miller & Kreisel Professional monitors, has many stand, wall and ceiling mounting options that make proper placement and installation easy and straightforward. M&K ST series wall brackets and stands (see Figures 3-5), are recommended because they are designed to facilitate proper installation. For more specific installation instructions, please consult the manuals included with the stand and bracket hardware. Information on various bracket and stand options can be obtained by visiting our web site or referring to our accessory catalog.



**FIGURE 4**

M&K Wall Mounting:  
Requires M&K ST-Wall Tilt Bracket &  
ST-Uni III Bracket



**FIGURE 6**

M&K ST-Stand System:  
Requires ST-Leg Tilt Kit, ST-1Base, &  
ST-Uni III Bracket



**FIGURE 5**

M&K ST-Stand System:  
Requires ST-Leg Tilt Kit, ST-1Base, &  
ST-Uni III Bracket

